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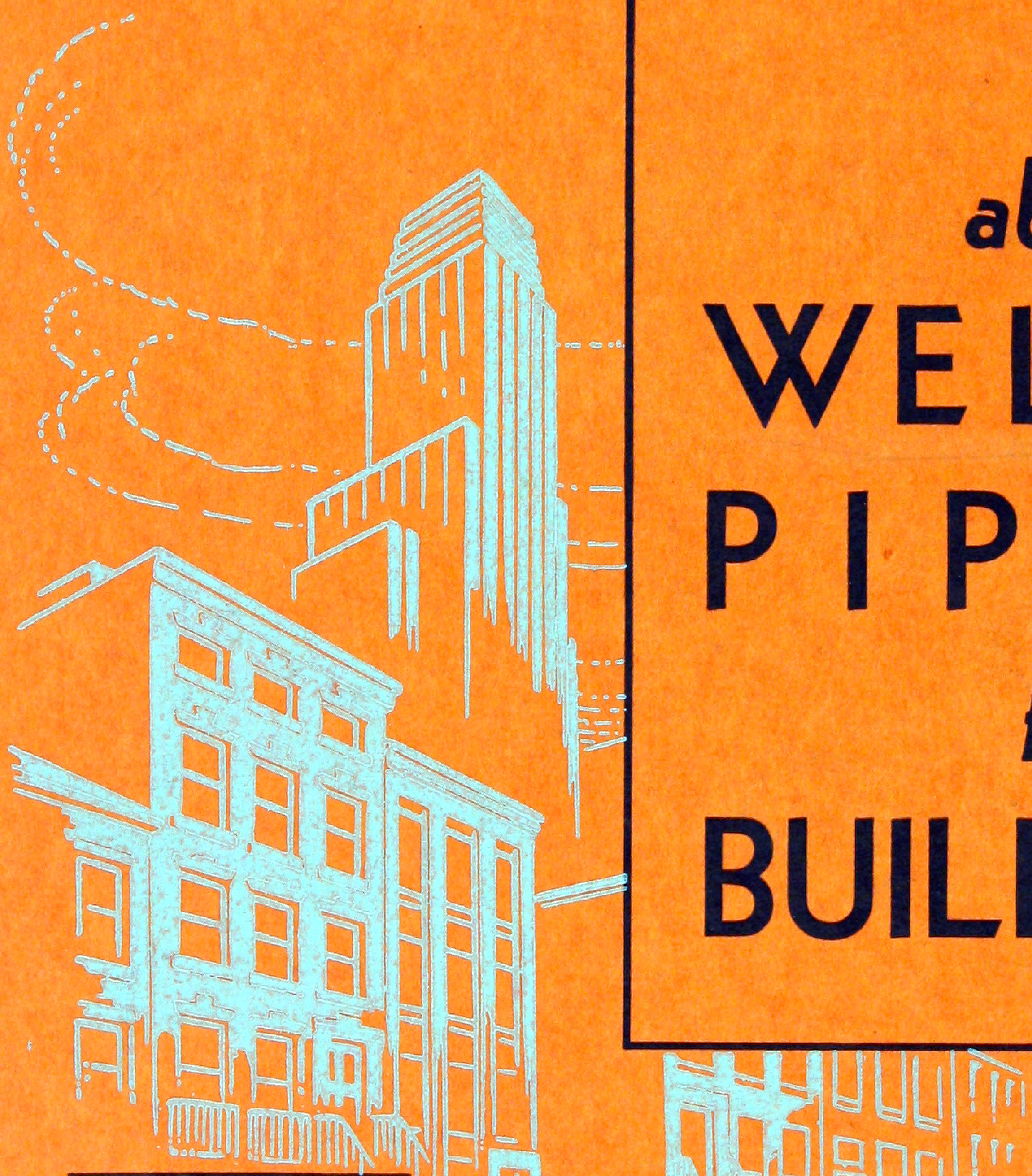
The FACTS about WELDED PIPING for BUILDINGS



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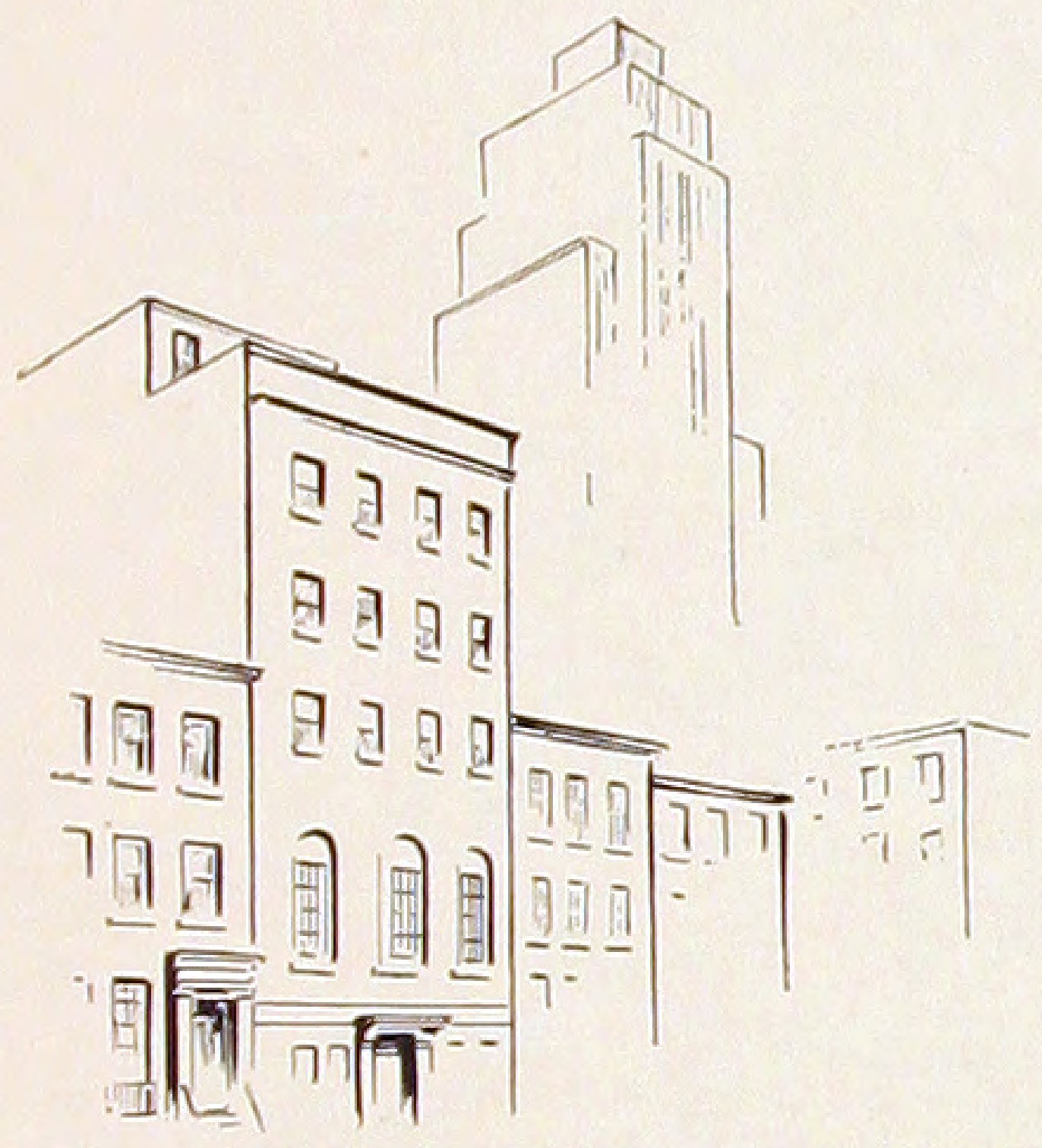
The FACTS about WELDED PIPING

No. 1

Now universally accepted



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THE use of welding for installing piping in buildings is no longer on trial. It has now been employed to an extent which definitely and indisputably establishes universal acceptance.

Statistics, which have been compiled of welded piping installations in the United States today, include virtually every industry and every type and size of building. And the rate at which installations are increasing, indicates convincingly that within a few years, welded piping for all buildings, large and small, will be standard practice.

It may be safely predicted that this is inevitable—now that comprehensive experience has *proved* that the overwhelming advantages claimed for welded piping, are *actual facts*.

It is the purpose of this series to present these advantages and to make clear that they hold true for piping in *residences and other small and medium-sized buildings*, as well as for the larger commercial, institutional and public edifices.

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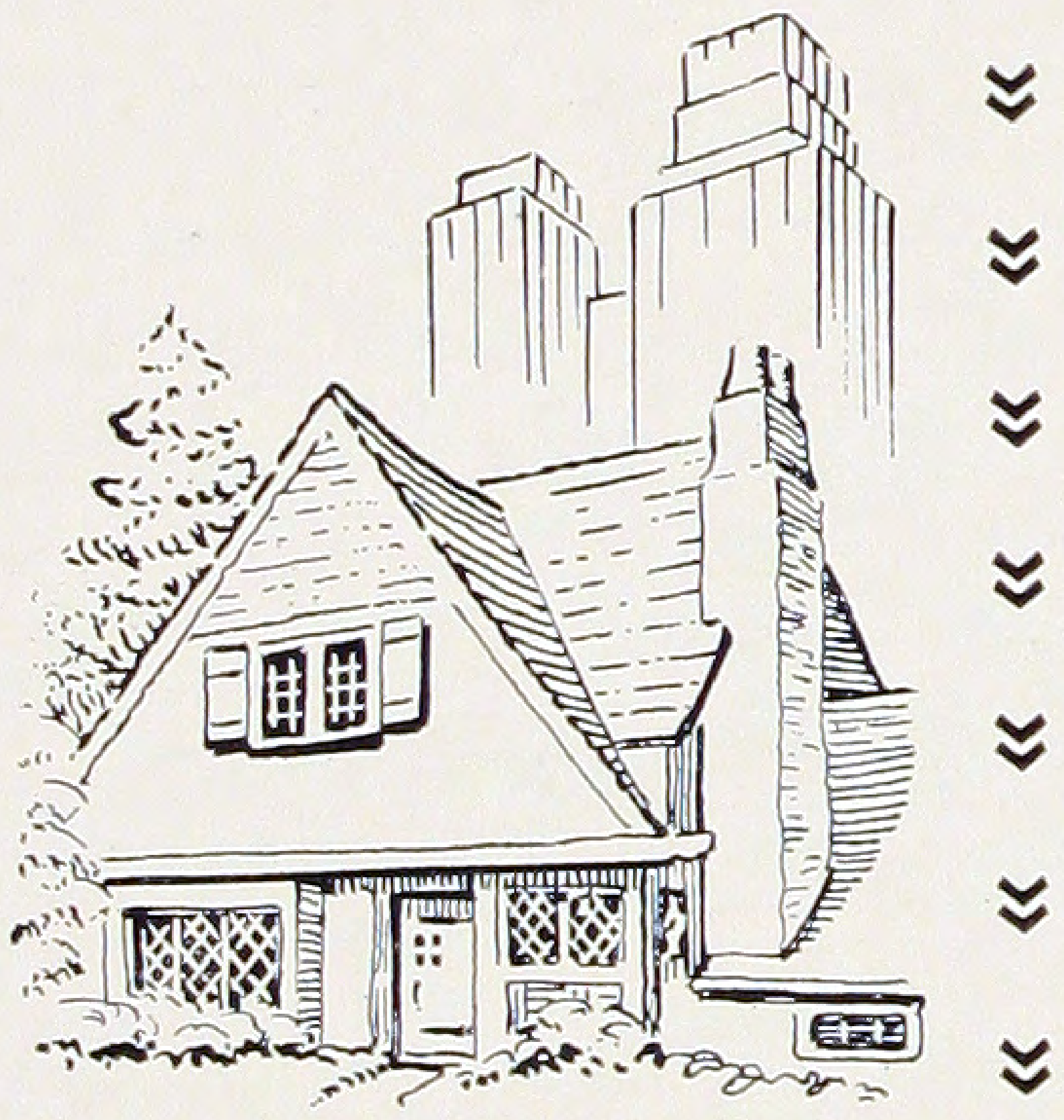
The FACTS about WELDED PIPING

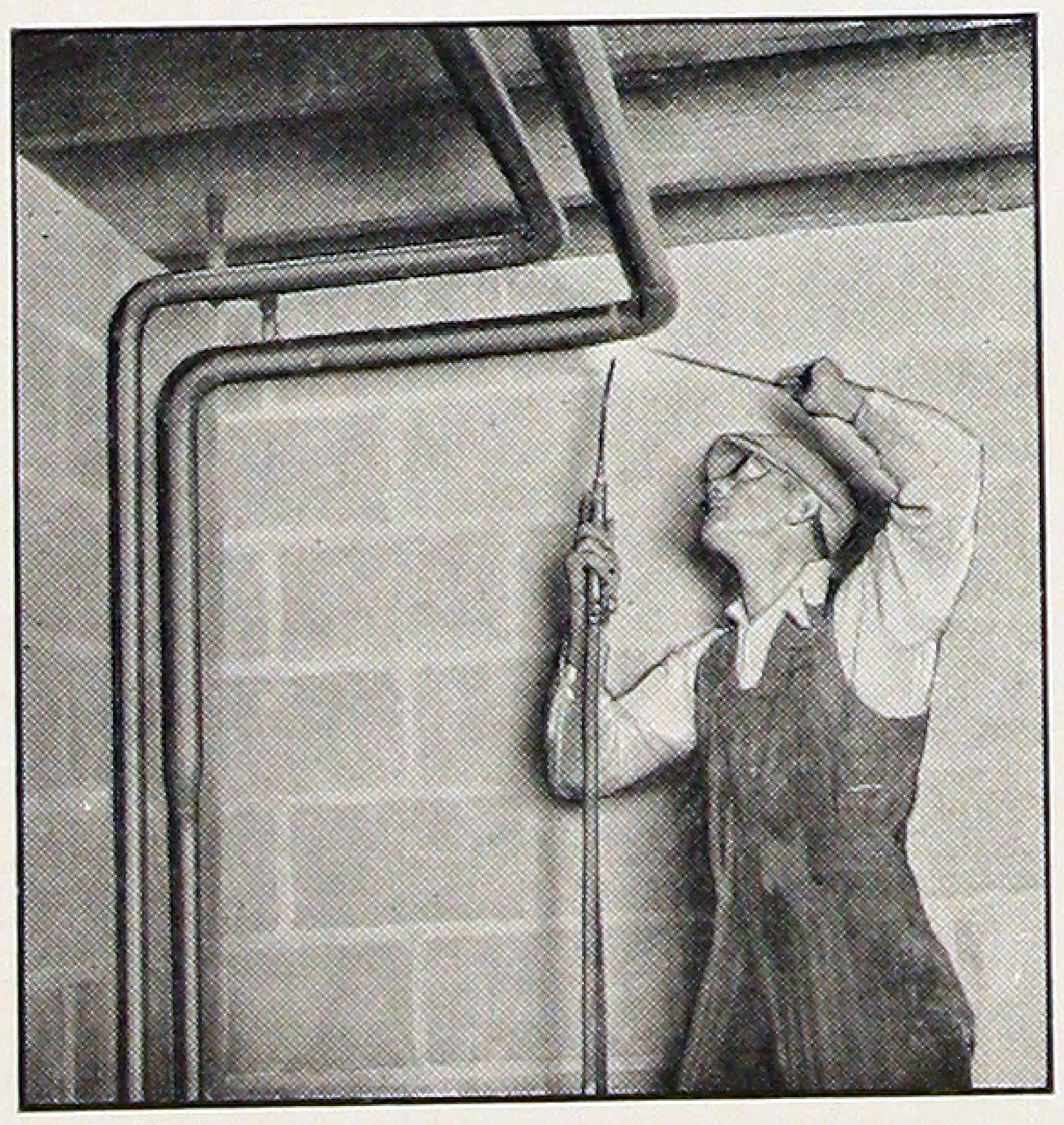
No. 2

Logical for small buildings as well as large . . .

LOWER material and installation costs; reduced weight, with its advantageous effect on building design and costs; more efficient operation; elimination of leaks and maintenance; permanence—these decisive advantages and economies of welded piping, which have established its use in large buildings, hold equally true for installations in residences and other small buildings.



And there are today no obstacles to preclude the use of welded piping in small buildings. Small pipe is welded by the oxyacetylene process just as readily and effectively as large. Trained journeymen welders are available today in every locality, who can consistently make welds on pipe down to ½″ which on test will prove stronger than the pipe itself. Small pipe and pipe fittings for welding, in the usual materials as well as in brass and copper, are on the market. Brass and copper fittings are available as well, for brazing or bronze welding.



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And existing small building installations—of which there are more than is generally realized—show conclusively that welded piping is just as practicable and just as desirable for the small project as for the large. In fact, the staunchest advocates of WELDED PIPING for small buildings are those who have experienced its benefits and economies.

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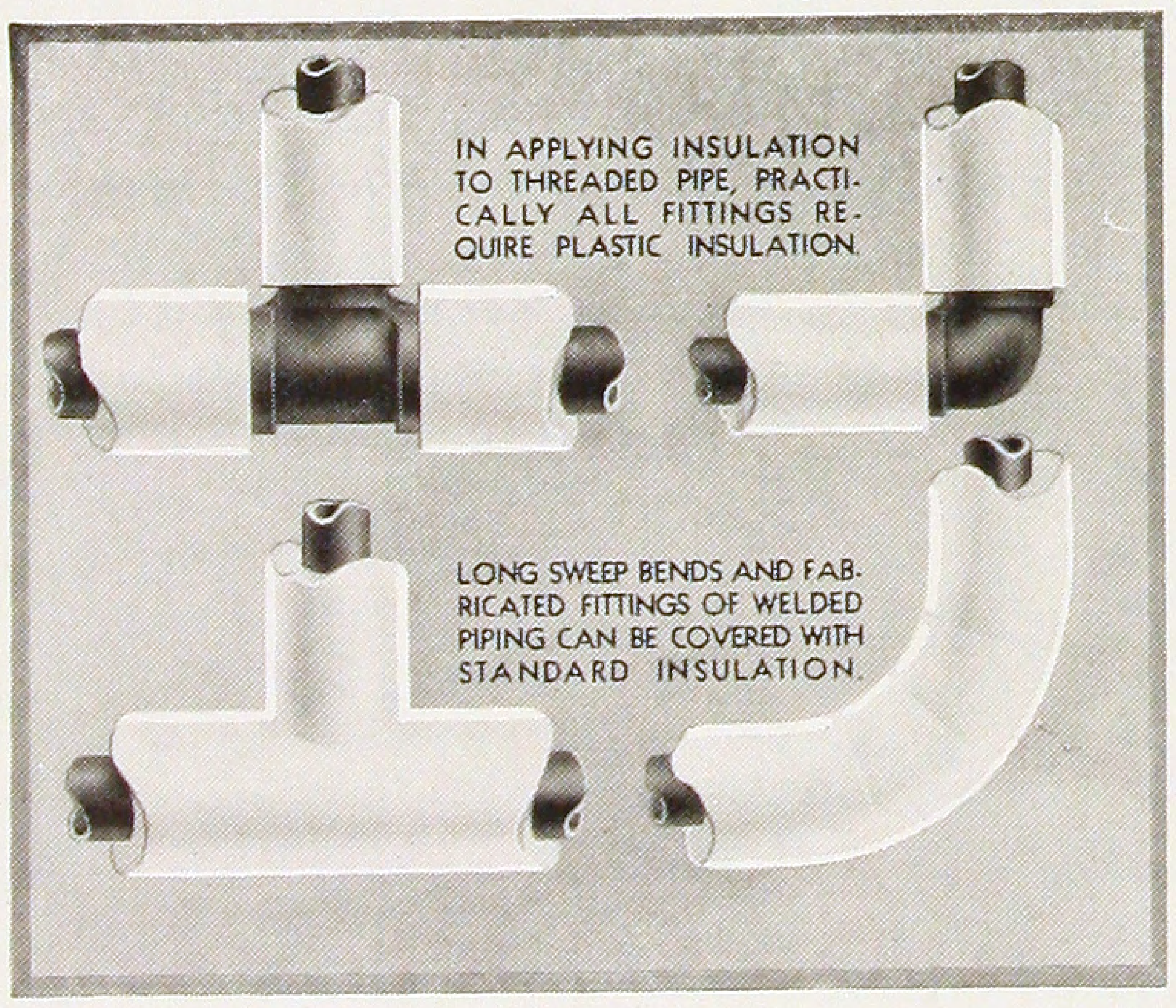
The FACTS about WELDED PIPING

No. 3

Lower in first cost . . .

THE first cost of a WELDED PIPING installation is substantially less than that of a threaded piping job. To demonstrate this, a small residence steam heating plant was laid out for threaded pipe and for welded pipe, boiler and radiators and their locations being identical in each case. Material lists were made up and costs computed. (See next two pages). Layouts and cost figures were checked and approved by several reputable heating engineers and contractors. Here are the facts.

Cost of pipe, pipe fittings and all other material, exclusive of insulation, was 21% less for the welded installation than for the threaded. This is due chiefly to the reduction in number of fittings required—242 for the threaded job as against only 13 for the welded.


IN APPLYING INSULATION TO THREADED PIPE, PRACTICALLY ALL FITTINGS REQUIRE PLASTIC INSULATION.
LONG SWEEP BENDS AND FABRICATED FITTINGS OF WELDED PIPING CAN BE COVERED WITH STANDARD INSULATION.

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Cost of insulating material for the welded job was 7% less than for the threaded, due to the smoothness of the welded piping at joints and fittings, and the elimination of so many fittings.

This is typical of the savings in material. In the item of labor costs, the savings are even greater. Figuring conservatively, WELDED PIPING means a lower first cost on residential and other comparatively small piping systems of at least 10%. On the larger projects the percentage is proportionately higher.

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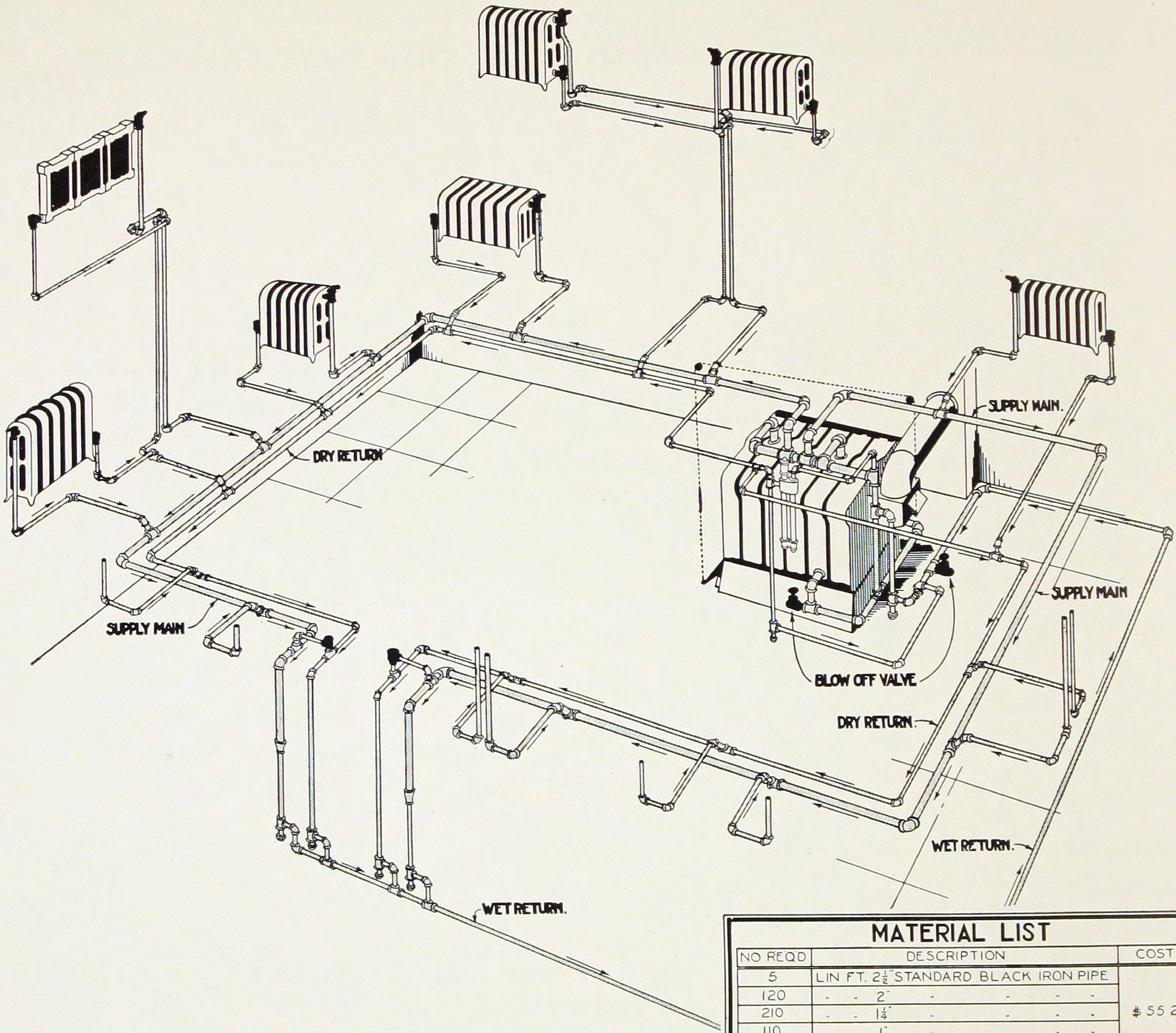


A Domestic Heating System using Threaded Piping

THIS is the residence heating plant, mentioned on the preceding page, which was laid out and itemized for both threaded piping and oxyacetylene welded piping to secure data on relative first costs.

As the bill of material shows, the threaded system requires 242 fittings, involving a large amount of time and labor in pipe cutting and threading.

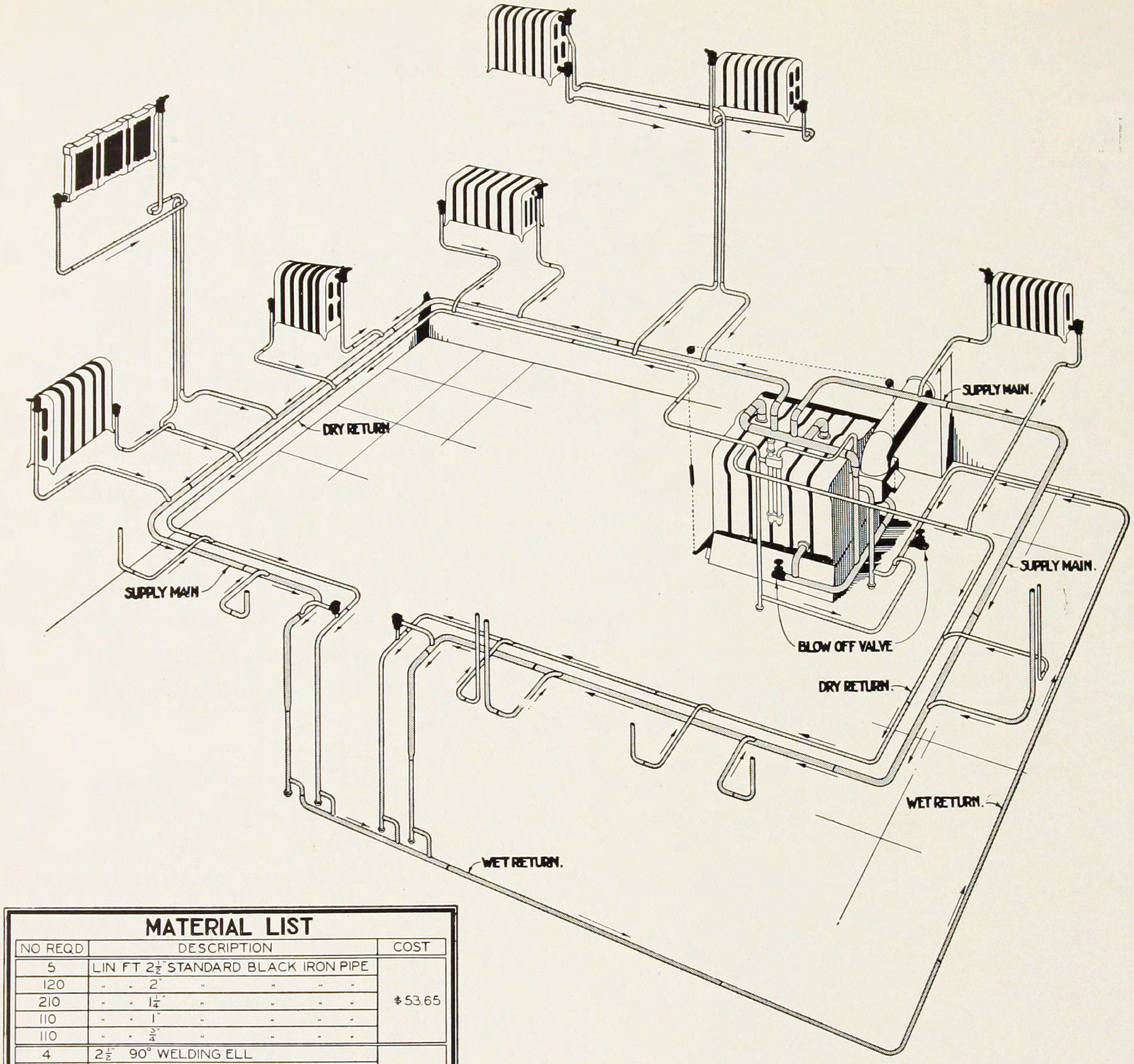
Evident in the layout are the short, sharp bends which characterize threaded piping. These bends, and the threaded joints, increase friction and turbulence and hinder the flow. A loss in pressure results, and with it a proportionate loss in heat. For a complete installation this loss mounts to serious proportions and is reflected in increased fuel consumption.

Costs given in the material lists are net. They do not include labor.

MATERIAL LIST

NO REQ'D	DESCRIPTION	COST
5	LIN FT. 2½" STANDARD BLACK IRON PIPE	$ 55 28
120	- - 2" - - - -	
210	- - 1¼" - - - -	
110	- - 1" - - - -	
110	- - ¾" - - - -	
3	2½" - 90° C I ELL	36.15
17	2" - - - -	
32	1¼" - - - -	
30	1" - - - -	
30	¾" - - - -	
4	1¼" - 45° - -	
9	1" - - - -	
5	¾" - - - -	
3	1¼" TO 1" - 90° C I. REDUCING ELL.	
4	1" - ¾" - - - - -	
1	2½" X 2½" X 2½" STD. C.I. TEE.	
1	2" X 2" X 2" - - -	
7	1¼" X 1¼" X 1¼" - - -	
2	1" X 1" X 1" - - -	
2	¾" X ¾" X ¾" - - -	
2	2½" X 2½" X 2" - - REDUCING TEE.	
3	2" X 2" X 1¼" - - - -	
9	2" X 2" X 1" - - - -	
6	1¼" X 1¼" X 1" - - - -	
5	1¼" X 1¼" X ¾" - - - -	
1	1" X 1" X ¾" - - - -	
2	2" TO 1¼" M.I. REDUCER	
6	1¼" M.I. PIPE CAPS.	
6	2" X 6" BLACK WROUGHT NIPPLE	
10	1¼" X 6" - - -	
6	1¼" X 3" - - -	
19	1" X 6" - - -	
11	¾" X 6" - - -	
2	2½" CL - - -	
4	1¼" - - - -	
1	CAN RED LEAD	.85
	85% MAGNESIA INSULATION.	243.24
	TOTAL	$335.52

THREADED.



MATERIAL LIST

NO REQD	DESCRIPTION	COST
5	LIN FT 2½" STANDARD BLACK IRON PIPE	$53.65
120	" " 2" " " " "	
210	" " 1¼" " " " "	
110	" " 1" " " " "	
110	" " ¾" " " " "	
4	2½" 90° WELDING ELL	9.38
2	2" 90° " "	
1	2½" TO 2" " REDUCER	
6	1¼" M.I. PIPE CAPS. SCREWED.	
	ACETYLENE, OXYGEN & WELDING ROD	9.60
	85% MAGNESIA INSULATION	228.43
	TOTAL	$301.06

PLAIN ENDS

The Same Heating System using WELDED PIPING

A COMPARISON of the two material lists discloses the following important savings in favor of the oxyacetylene welded piping.

10.3% in cost of pipe and fittings. Only 13 fittings are needed, a saving of 229 over the threaded installation. Many fittings are eliminated by making long sweep bends in the pipe. Obviously, this cannot be done with threaded piping because of the impossibility of assembling bent pipe. These smooth bends, combined with the smoothness of welded joints, minimize friction and turbulence, thereby reducing pressure and heat loss.

6.1% in cost of insulating material.

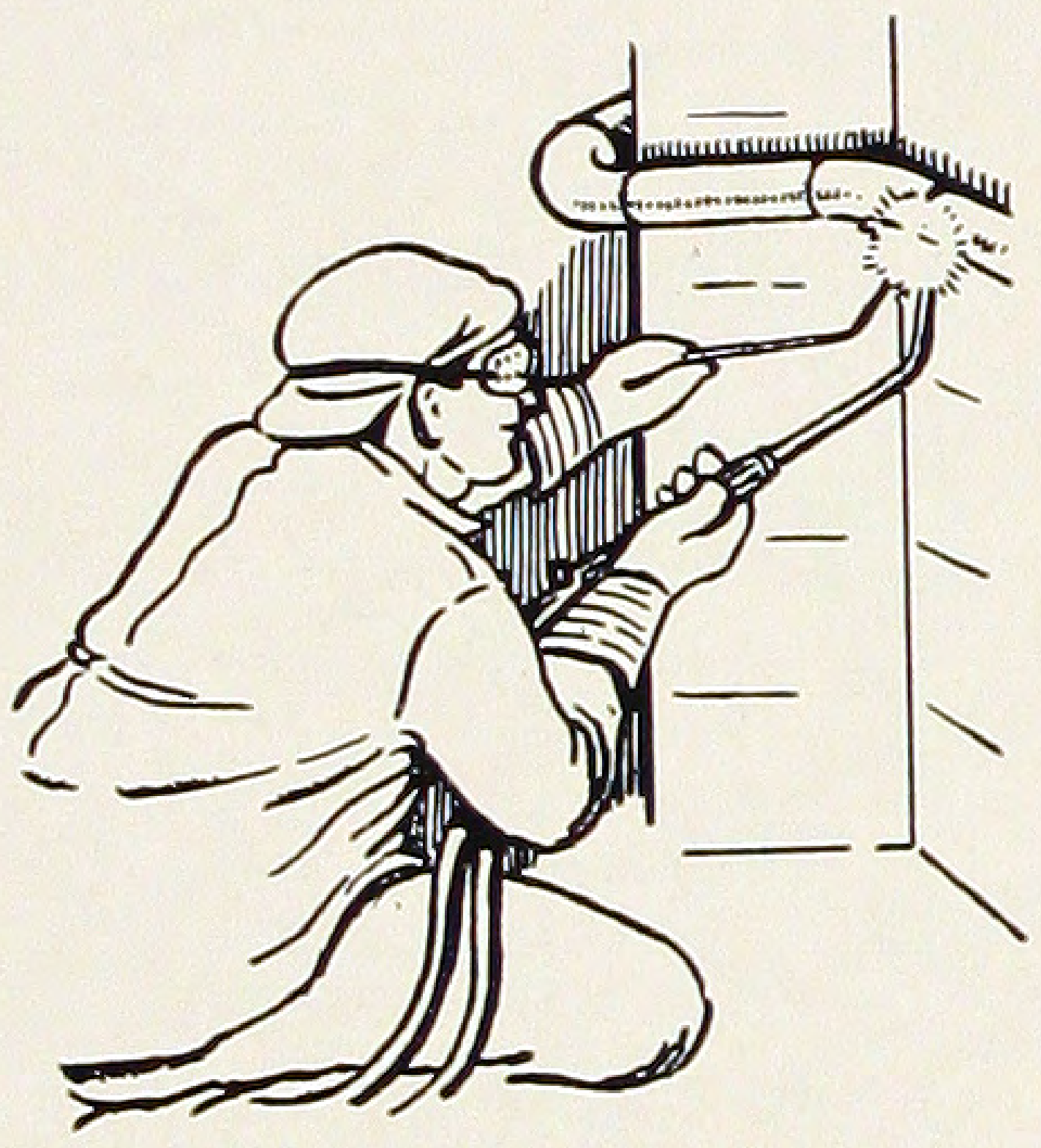
But even greater are the savings in erection time and labor due to the elimination of pipe cutting and threading, and the comparative ease with which insulation can be applied to welded piping, particularly at bends and fittings as shown in No. 3. WELDED PIPING means both lower first cost and lower operating costs.

The FACTS about WELDED PIPING

No. 4

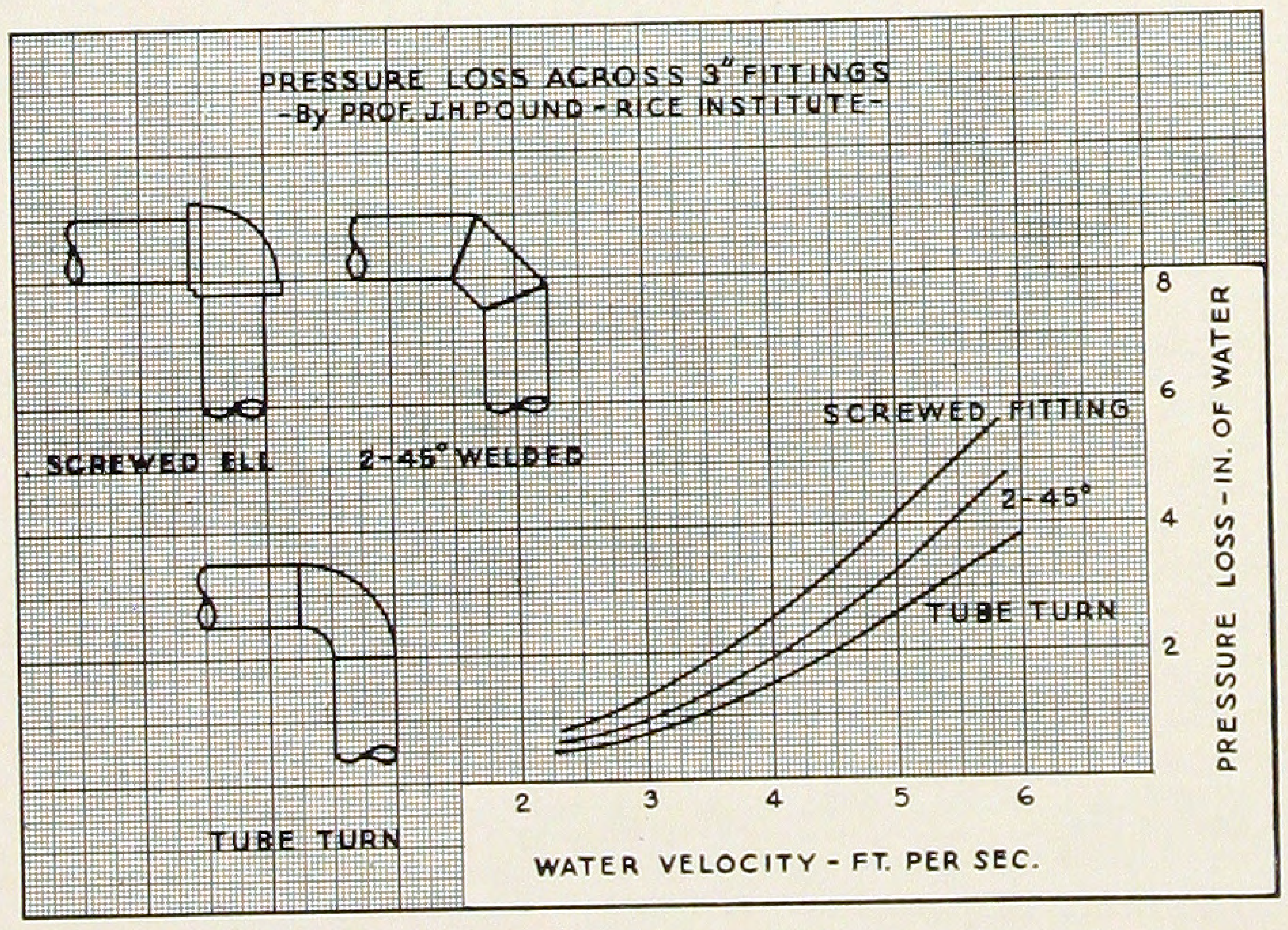
Reduced pressure loss saves fuel . . .

THE inside of a WELDED PIPING system is smooth and free from projecting pipe ends or other obstructions to flow. Sweeping turns replace the sharply bent screwed fittings. Friction and turbulence are substantially less than in a threaded installation. Pressure loss is reduced to a minimum.



For example, take a simple ell in a 3-inch line. Accurate tests (see chart) show approximately 19% less drop in pressure through the 45° welded ell than through the threaded ell, while through the welded Tube Turn it is approximately 38% less.

This reduction in pressure loss holds true, in greater or lesser degree, for all the various types of welded fittings and for welded joints. Now, loss of pressure is accompanied by a corresponding loss of heat, for by natural law, temperature varies directly with pressure. Therefore, the reduction in pressure loss effected by the welded installation, means a proportionate saving in fuel.



Naturally the larger the building and the more extensive the piping system, the greater is the saving in fuel resulting from the use of WELDED PIPING.

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The FACTS about WELDED PIPING

No. 5

Reduced weight a vital factor for economy

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IN the matter of weight, the advantage of WELDED PIPING over threaded is decisive.

Pipe manufactured for welding has a wall thickness approximately 25% less in the smaller sizes and 40% less in the larger, than the corresponding pipe made for threading. It does not require the extra thickness which the latter pipe must have to compensate for metal removed in thread cutting.

In fittings, the weight advantage is even more marked. A difference of 75% in favor of the welded fitting is not uncommon.

An idea of what this weight saving amounts to, for a complete installation, may be obtained from some recently published figures. The building, a medium sized structure, was originally designed for threaded piping. The change to WELDED PIPING saved 14,400 lbs. of material, plus the extra cost of shipping and hauling, plus the extra time and effort to handle it on the job.

But even more important is the simplification in the structure of a building made possible by such great reduction in the weight to be supported and the corresponding economy in the cost of the building.

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The FACTS about WELDED PIPING

No. 6

Piping "tailored" to fit

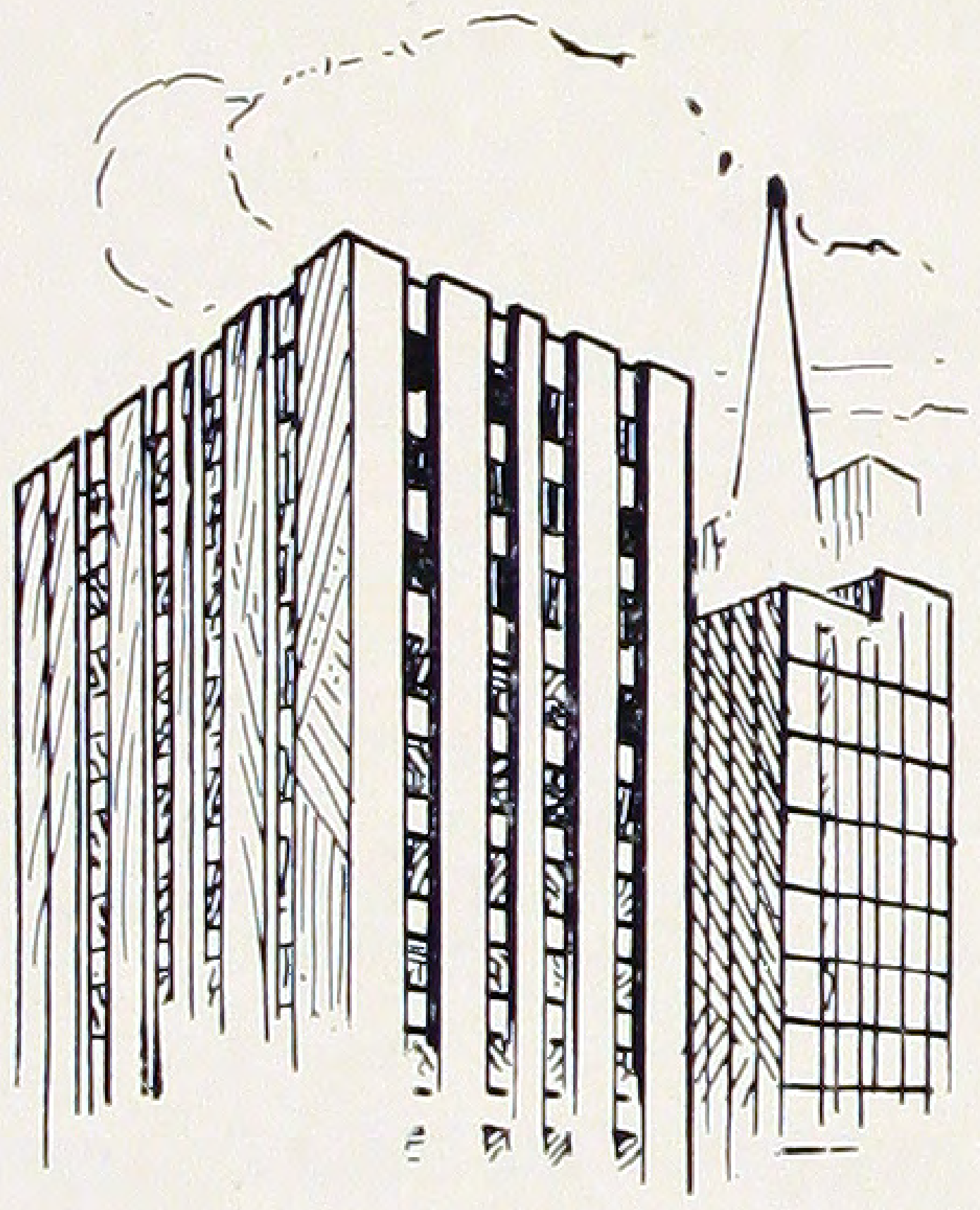
THE comparative ease and speed with which WELDED PIPING can be installed, is one of the basic reasons for its rapid rise to favor.

In the first place, the elimination of the thread cutting operation is a vital factor in saving time.

Erection schedules are further shortened by the method of installing welded piping commonly employed today, which welding has made practicable. Whole sections of pipe and fittings are assembled in the contractor's fabrication shop or in a shop established on the job. They are then placed in position and welded together. This leaves a minimum of welds to be made in position.

By this method, the making of difficult assemblies is simplified, the obstacle of erection in inaccessible locations is overcome and the piping is made to conform accurately to plan without the forcing which is often necessary in joining threaded piping.

A neat, close-fitting piping system is the result—an installation that is literally "tailored" to *fit*—with the simple, easily manipulated oxyacetylene cutting and welding torch, the only tool needed.



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The FACTS about WELDED PIPING

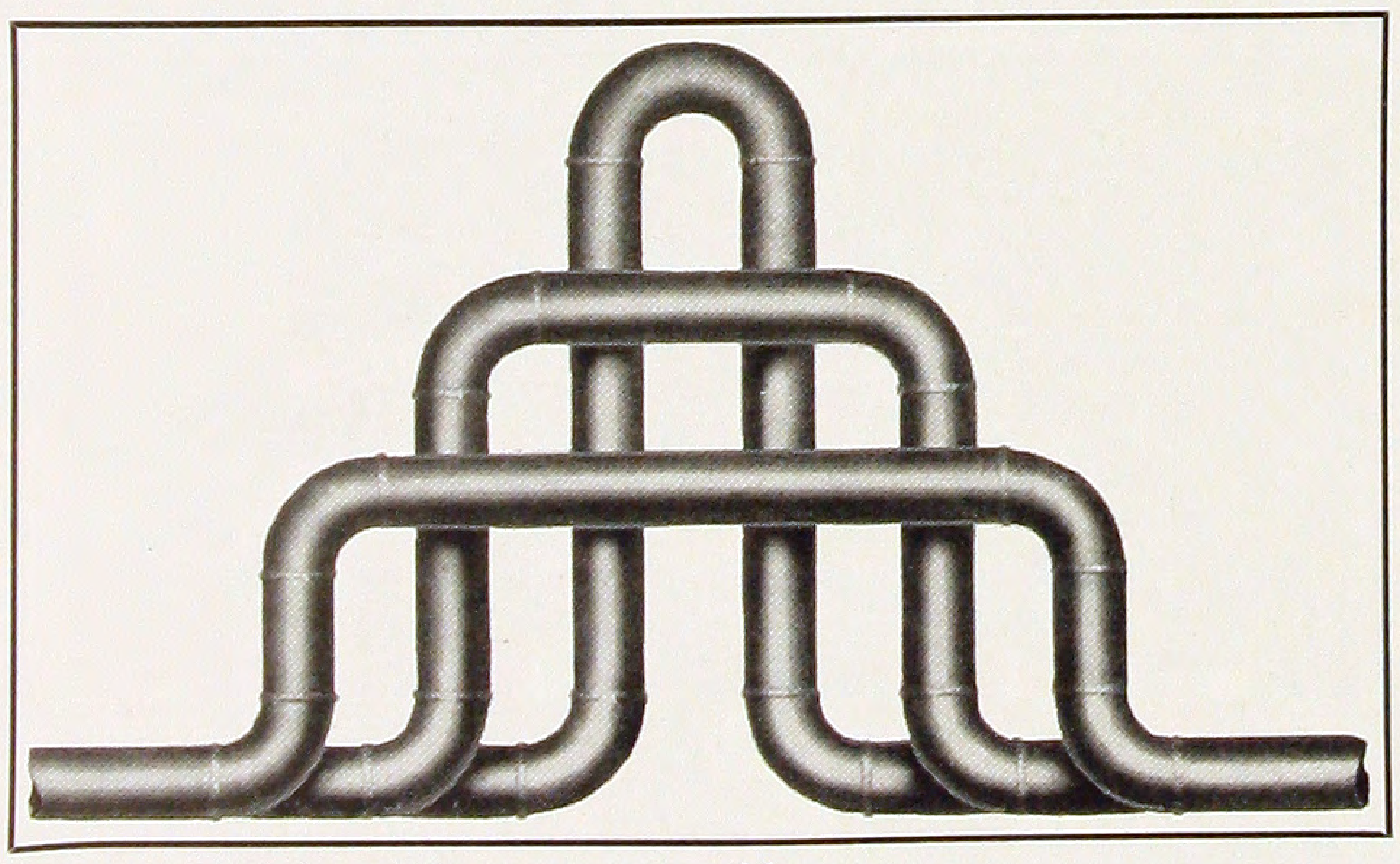
No. 7

Efficient expansion and contraction loops..

EXPANSION and contraction are provided for in the WELDED PIPING installation in the same way as in the threaded piping system. Similar loops and joints are used.

But in the making of the loops, and in their efficiency and durability, welding offers further advantages and economies.

Loops of practically any desired shape can be quickly fabricated on the job from standard welding fittings and straight lengths of pipe. Such loops are uniform in wall thickness and strength. There is no straining of the metal as in the threaded piping practice of making loops from single pieces of pipe. There is no reduction of cross-section and consequently no added resistance to flow. Besides, welded loops can be formed to fit neatly into the available space, and are assembled to the rest of the piping with the same smooth joint which characterizes all welded connections. Such loops are also easily insulated.



These advantages are worth while and they contribute their share toward making WELDED PIPING a more efficient and more satisfactory installation.

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The FACTS about WELDED PIPING

No. 8

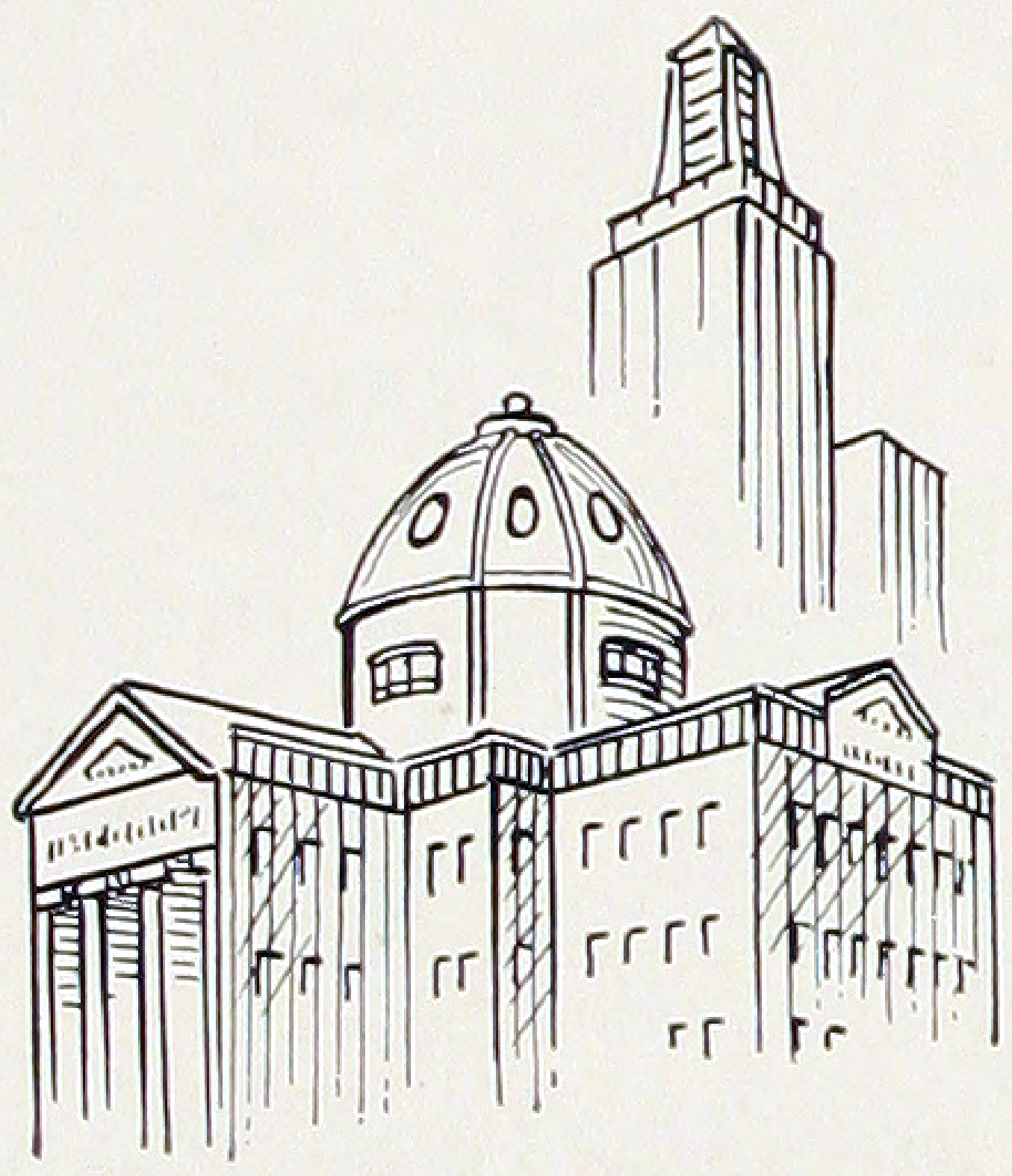
Banishes leaks, trouble, maintenance . . .

OXYACETYLENE pipe welding has reached the point of perfection where it is no trick at all for the average journeyman welder to make joints that are actually stronger than the pipe itself.

The development of welding rods for use with different kinds of pipe has helped to bring about this result. As constructed today, a WELDED PIPING installation is virtually one homogeneous system, smooth on the inside, uniform in strength and leak-proof throughout its entire extent. Because of the reduction in friction and turbulence it is more efficient and economical in operation. And it practically eliminates maintenance expense and interruptions to service.

Further economies are effected, because WELDED PIPING can be more readily and more efficiently insulated, particularly at joints and fittings.

From the standpoint of satisfaction to the owner and kindness to his pocketbook, the palm goes without a struggle to WELDED PIPING.



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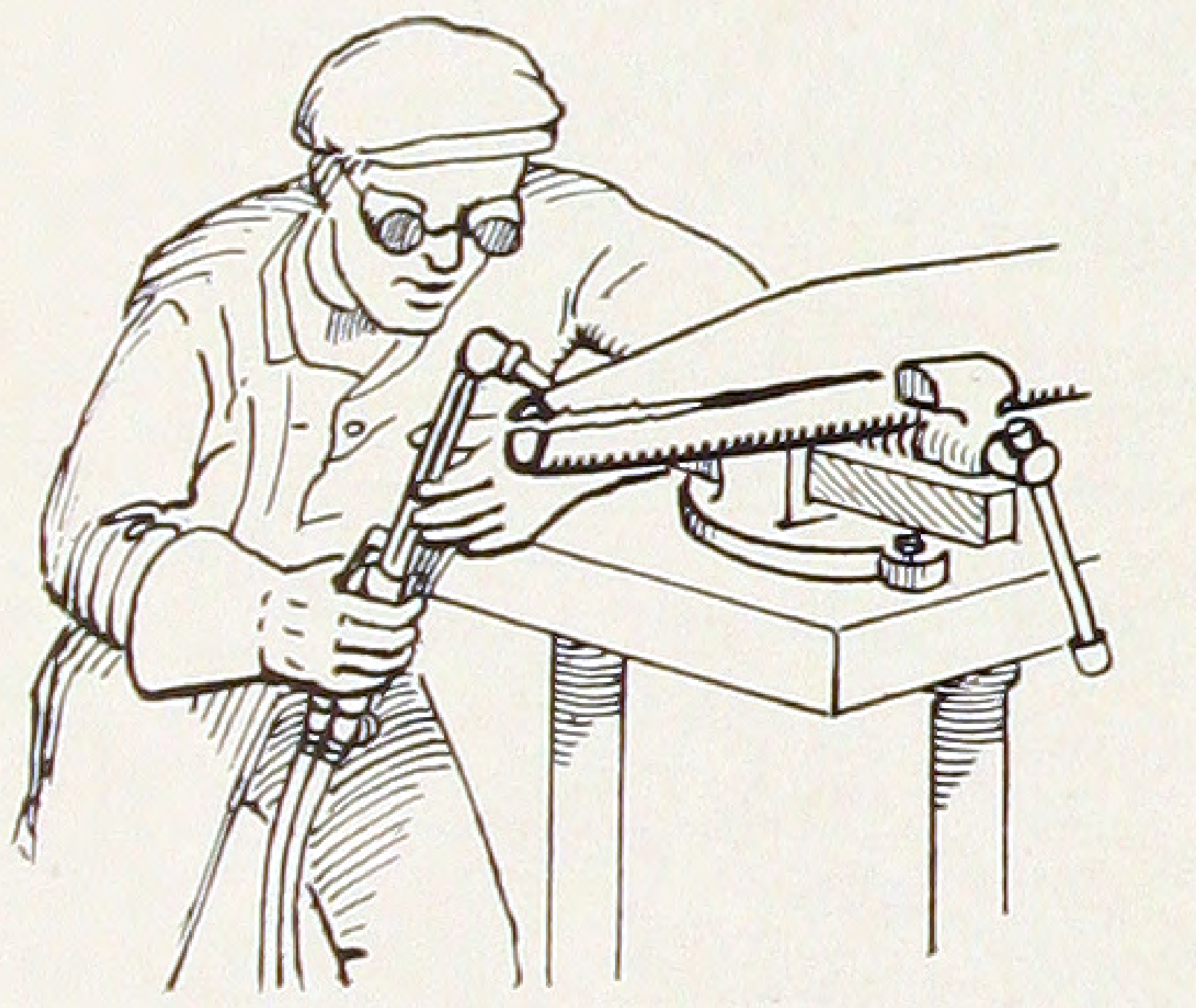
The FACTS about WELDED PIPING

No. 9

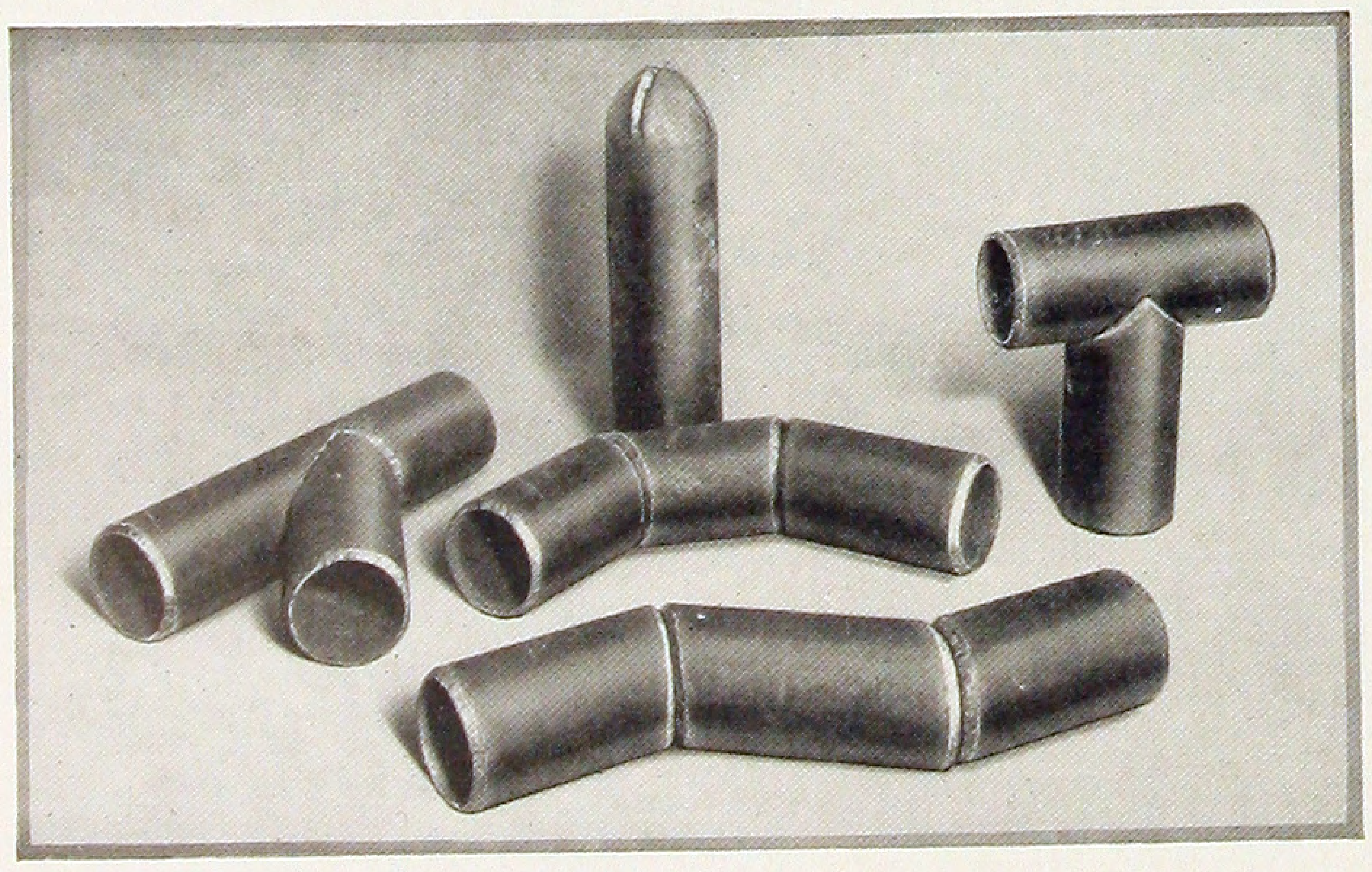
Economies in welded fittings

FEWER fittings are required, for on small piping, changes in direction are readily made by bending with the aid of the oxyacetylene torch. On one typical small steam heating layout, the substitution of welded piping for threaded, reduced the number of fittings from 242 to 13. Besides the saving in material and pipe cutting and threading time and labor, 242 possible sources of trouble were eliminated.

Friction and turbulence losses are reduced from 15 to 40% by welded fittings, while the long sweep bends made practicable by welded piping, still further cut down pressure loss and its accompanying loss of heat.



Welded fittings also mean a saving in insulating material and the time and labor required to apply it, as well as a more efficiently insulated system.



Another advantage, particularly where special fittings are needed, is that all types can be readily fabricated on the job with the oxyacetylene cutting and welding torch, utilizing for the most part, short ends of pipe which would otherwise be scrapped.

It is evident that from the stand point of fittings alone, WELDED PIPING offers decided benefits and economies in installation and operating costs.

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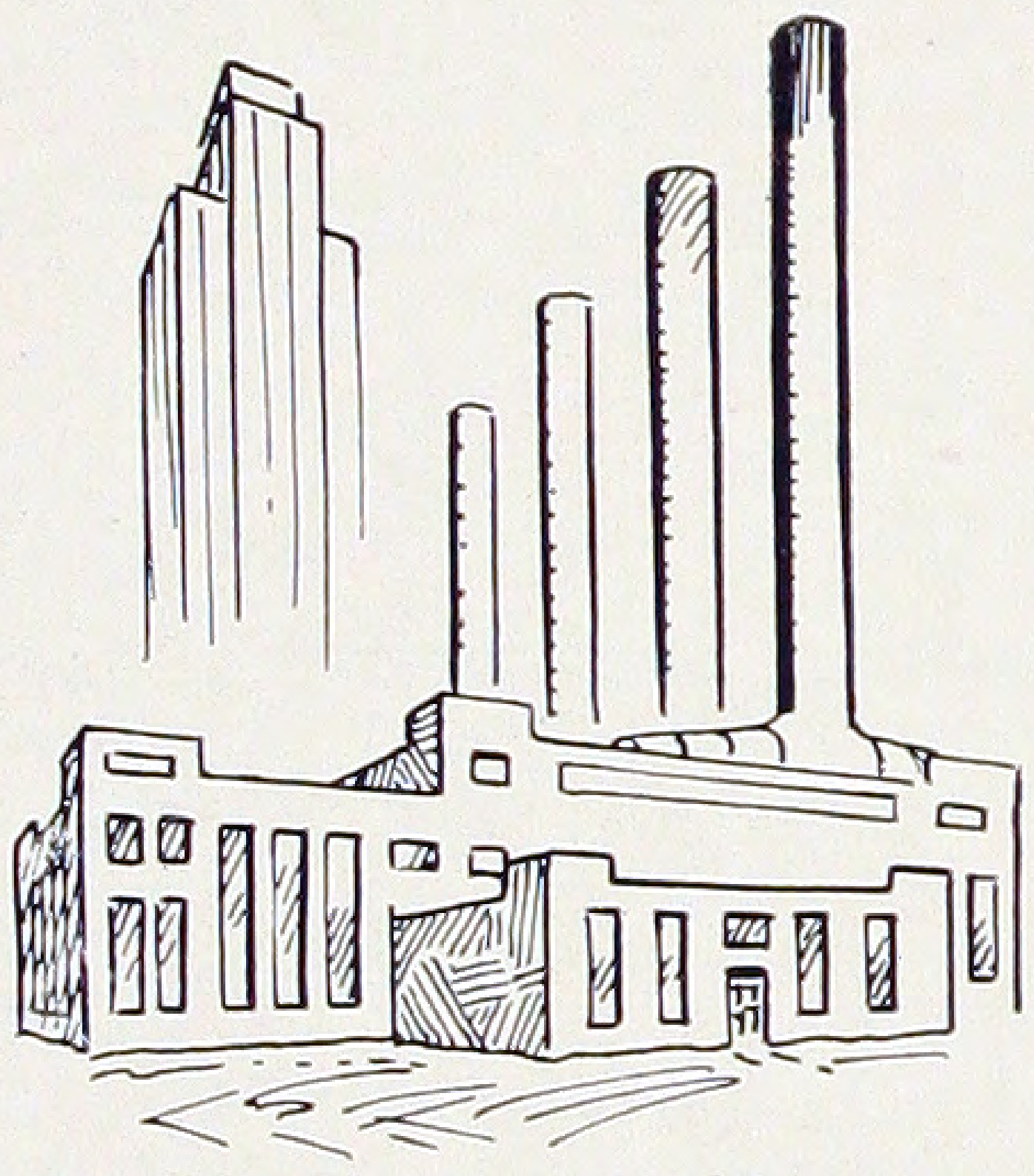
The FACTS about WELDED PIPING

No. 10

Summary

of principal advantages and economies . . .



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Lower First Cost

A combination of lower cost of pipe and fittings, reduced cost of insulation and its application, easier and faster installation, resulting in labor saving and shorter erection schedules.

Reduced Weight

The elimination of tons of material to be handled and supported. This is reflected in simplification of building structures with corresponding reduction in cost, plus savings in shipping and erection costs.

More Efficient Operation

Greatly reduced friction and turbulence, minimizing pressure loss and thereby conserving heat and saving fuel.

Leak-Proof, Permanent Installation

Insuring trouble-free service with virtually no maintenance expense.

These are the fundamental advantages and economies of WELDED PIPING. They are no longer subject to controversy. They stand proved by actual experience and figures on hundreds of installations in both large and small buildings. From the two decisive viewpoints of efficiency and economy they make WELDED PIPING the logical system for *all* buildings.

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